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10/521,774	01/21/2005	Akira Obuchi	040894-7130	2534

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EXAMINER	
YOUNG, NATASHA E	
ART UNIT	PAPER NUMBER
1797	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,774	OBUCHI ET AL.	
	Examiner	Art Unit	
	NATASHA YOUNG	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12 and 14-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12,and 14-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Karoliussen (US 7,284,599 B2).

Regarding claim 1, Karoliussen discloses a heat exchanger comprising: a partition type heat transfer material for parting a high temperature fluid and a low temperature fluid from each other, wherein the heat transfer material is bellows-shaped and is arranged such that both the fluids flow parallel or counter to each other mainly through the gap portion in the bellows section of the heat transfer material along the ridge line or valley line thereof, the heat transfer material separates the high temperature fluid and the low temperature fluid from each other throughout the heat exchanger (see figure 8 and column 3, lines 12-47).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-10, 12, 14-20, and 22-24 rejected under 35 U.S.C. 103(a) as being unpatentable over Jobson et al (EP 1 016 777 A2) in view of Tongu et al (US 5,282,507) and Von Blucher et al (US 4,981,501).

Regarding claims 2-3, Jobson et al discloses a reactor comprising: (a) a self-heat exchange type heat exchanger having a partition type heat transfer material for parting a high temperature fluid and a low temperature fluid from each other, wherein the heat transfer material is bellows-shaped and is arranged such that both the fluids flow

counter to each other mainly through a gap portion in the bellows section of the heat transfer material along the ridge line or valley line thereof and the heat transfer material has a fluid forwarding space portion at one or both ends thereof crossing the ridge line of the bellows section for forwarding one of the fluids to the gap portion in the bellows section on the opposite side thereof, and the fluid which has been forwarded to the opposite side via the fluid forwarding space portion acts as the other fluid to be heat-exchanged to perform heat exchange; and (b) a heating element or heat-absorbing element provided in the fluid forwarding space portion of the heat exchanger (see Abstract, paragraphs 0004, 0011, and 0017, and figure 2).

In addition, Jobson et al discloses catalyst material is applied to the carrier walls and is exposed to the gas flow passages and an impurity adsorber/desorber agent is applied to the carrier walls and is exposed to the gas flow passages (see paragraph 0009) such that a functional material selected from the group of an adsorbent (an adsorption/desorption agent applied to the carrier walls) and a heat storage material is provided in the gap portion of the bellows section of the heat transfer material (a thin metal or foil, such as stainless steel) separately of the heat transfer material (see paragraphs 0015-0018).

Jobson et al does not disclose (c) at least one air-permeable structure different from the heat transfer material is provided in the gap portion of the bellows section of the heat transfer material, wherein a functional material selected from the group of adsorbent and a heat storage material is provided in the gap portion of the bellows section of the heat transfer material as the air-permeable structure, different from the

heat transfer material, or supported on the air-permeable structure, different from the heat transfer material.

Tongu et al discloses a heat exchange system (Abstract) comprising a bellows-fin (101) and a plurality of expanded metals (102) each of which is filled into the gap between the adjacent two fins of the bellows-fin (101) (see figure 5-6 and column 5, line 55 through column 6, line 26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Jobson et al with the teachings of Tongu et al such that an insert is provided in the gap portion of the bellows section of the heat transfer material in order to prevent the deformation of the bellows-fin (see Tongu et al column 5, line 63 through column 6, line 8).

Von Blucher et al discloses an adsorption filter with a highly air-permeable, three-dimensional carrier framework formed of wires, monofilaments or stays, to which a layer of granular, particularly spherical adsorber particles is affixed (see column 1, lines 46-63).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Jobson et al and Tongu et al with the teachings of Von Blucher et al such that wherein a functional material selected from the group of adsorbent and a heat storage material is provided in the gap portion of the bellows section of the heat transfer material as the air-permeable structure in order to achieve excellent separation effects for pollutants and gases at extremely low pressure drops (see Von Blucher et al column 5, lines 45-60).

The prior art references do not disclose at least one air-permeable structure wherein a functional material selected from the group of adsorbent and a heat storage material is provided in the gap portion of the bellows section of the heat transfer material as the air-permeable structure, different from the heat transfer material, or supported on the air-permeable structure, different from the heat transfer material.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have at least one air-permeable structure wherein a functional material selected from the group of adsorbent and a heat storage material is provided in the gap portion of the bellows section of the heat transfer material as the air-permeable structure, different from the heat transfer material, or supported on the air-permeable structure, different from the heat transfer material, since it has been held to be within the general skill of a worker in the art to select known material on the basis of its suitability for the intended use as a matter of obvious design choice.

Regarding claim 4, Jobson et al discloses a reactor wherein a catalyst which accelerates exothermic reaction is supported on the entire surface of the heat transfer material of the heat exchanger or the surface thereof in the vicinity of the fluid forwarding space portion and as the fluid there is used one including the reactive components (see paragraphs 0009 and 0015).

Regarding claim 5, Jobson et al discloses a reactor wherein as the heat transfer material of the heat exchanger there is used one having heat storage capacities, a catalyst which accelerates exothermic reaction is supported on the entire surface of the heat transfer material of the heat exchanger or the surface of the region close to the

inlet/outlet of the fluid, an adsorbent which adsorbs the reactive components at low temperature and releases the reactive components at high temperature is supported on the entire surface of the heat transfer material of the heat exchanger or the surface thereof in the vicinity of the fluid forwarding space portion and as the fluid there is used one including the reactive components (see paragraphs 0015-0016 and 0018), since metals are heat conductive these materials are interprets as having heat storage capacities.

Regarding claims 6-7, Jobson et al discloses a reactor further comprising: a particle removing filter for catching and removing fine particles provided in close contact with the side of the heat transfer material of the heat exchanger to which the fluid is forwarded (see Abstract), since the device adsorbs impurities.

Regarding claim 8, Jobson et al disclose a reactor wherein the heat transfer material includes a filtrating function allowing gas permeation and particle catch (see Abstract), since the device adsorbs impurities.

Regarding claim 12, Jobson et al does not disclose a self-heat exchange type heat exchanger wherein the air-permeable structure acts as a spacer.

Jobson et al does not disclose filter material provided in the gap portion of the bellows section of the heat transfer material.

Tongu et al discloses a heat exchange system (Abstract) comprising a bellows-fin (101) and a plurality of expanded metals (102) each of which is filled into the gap between the adjacent two fins of the bellows-fin (101) (see figure 5-6 and column 5, line 55 through column 6, line 26) and because a mesh-like metal member (air permeable)

may be used instead of the expanded metal element (102) is interpreted as an air-permeable spacer

Regarding claim 14, Jobson et al discloses a self-heat exchange type heat exchanger wherein the surface of the heat transfer material is partly opened to form a fluid forwarding space portion (see figure 2, elements 9 and 10 (reversing chambers)).

Regarding claim 15, Jobson et al does not disclose a self-heat exchange type heat exchanger wherein the end of the heat transfer material is partly cut away to form a fluid forwarding space portion.

It would have been an obvious matter of design choice to have the end of the heat transfer material is partly cut away to form a fluid forwarding space portion, since applicant has not disclosed that having the end of the heat transfer material is partly cut away to form a fluid forwarding space portion solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with or without the end of the heat transfer material partly cut away to form a fluid forwarding space portion.

Regarding claim 16, Jobson et al discloses a self-heat exchange type heat exchanger wherein the surface of the heat transfer material is partly provided with one or a plurality of openings which are closed at the circumference thereof to form a fluid forwarding space portion (see figure 2, elements 9 and 10 (reversing chambers)).

Claims 17-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Jobson et al (EP 1 016 777 A2), Tongu et al (US 5,282,507), and Von Blucher et al (US 4,981,501) as applied to claim 12 above, and further in view of Burkhart (US 3,679,062).

Regarding claim 17, Jobson et al discloses a self-heat exchange type heat exchanger wherein as the heat transfer material there is used one having no air permeability, and the self-heat exchange type heat exchanger is formed by the heat transfer material (see Abstract, paragraphs 0004, 0011, and 0017, and figure 2), where 6a is the internal heating element.

Jobson does not disclose a self-heat exchange type heat exchanger is formed by the heat transfer material, a structure for spacer and a filter cloth in combination.

Burkhart discloses a filter leaf, a spacer, and a filter cloth (see Abstract and column 1, lines 33-40).

The combination of the prior art elements of heat transfer material, a spacer capable of filtering, and a filter cloth in combination would have yielded the predictable result of increasing the effectiveness of the catalytic purification device.

Regarding claim 18, Jobson et al does not disclose a self-heat exchange type heat exchanger wherein the structure extends beyond the end of the fluid forwarding space portion of the heat transfer material, and a filter cloth is formed therearound in the form of bellows.

Burkhart discloses a filter leaf, a spacer, and a filter cloth (see Abstract and column 1, lines 33-40).

It would have been an obvious matter of design to construct filter covers in the shape of bellows, since applicant has not disclosed that filter covers in the shape of bellows solves any stated problems or is for any particular purpose and it appears that the invention would perform equally well with filter covers in the shape of bellows.

Regarding claim 19, Jobson et al discloses a self-heat exchange type heat exchanger wherein the surface of the heat transfer material is partly opened to form a fluid forwarding space portion, or the end of the heat transfer material is partly cut away to form a fluid forwarding space portion (see figure 2, elements 9 and 10 (reversing chambers)).

Regarding claim 20, Jobson et al does not disclose a reactor wherein the heat transfer material having a filtrating function is retained and formed in the form of a structure for spacer in the form of bellows.

Tongu et al discloses a heat exchange system (Abstract) comprising a bellows-fin (101) and a plurality of expanded metals (102) each of which is filled into the gap between the adjacent two fins of the bellows-fin (101) (see figure 5-6 and column 5, line 55 through column 6, line 26) such that a filtrating function is retained and formed in the form of a structure for spacer.

Von Blucher et al discloses an adsorption filter with a highly air-permeable, three-dimensional carrier framework formed of wires, monofilaments or stays, to which a layer of granular, particularly spherical adsorber particles is affixed (see column 1, lines 46-63) in the form of bellows (see figure 2).

Regarding claim 24, Jobson et al does not disclose a self-heat exchange type heat exchanger wherein the functional material is provided on the air-permeable structure acting as a spacer.

Tongu et al discloses a heat exchange system (Abstract) comprising a bellows-fin (101) and a plurality of expanded metals (102) each of which is filled into the gap

between the adjacent two fins of the bellows-fin (101) (see figure 5-6 and column 5, line 55 through column 6, line 26) such that a filtrating function is retained and formed in the form of a structure for spacer.

Von Blucher et al discloses an adsorption filter with a highly air-permeable, three-dimensional carrier framework formed of wires, monofilaments or stays, to which a layer of granular, particularly spherical adsorber particles is affixed (see column 1, lines 46-63).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karoliussen (US 7,284,599 B2) as applied to claim 1 above, and further in view of Jobson et al (EP 1 016 777 A2).

Regarding claim 21, Karoliussen does not disclose a heat exchanger further comprising: a functional material selected from the group of an adsorbent and a heat storage material provided in the gap portion of the bellows section of the heat transfer material separately of the heat transfer material.

Jobson et al discloses the hat exchanger further comprising: a functional material selected from the group of an adsorbent and a heat storage material provided in the gap portion of the bellows section of the heat transfer material separately of the heat transfer material (see paragraph 0009).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Friedrich et al with the teachings of Jobson et al for the added benefits of adsorbing impurities.

Claims 9-10 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jobson et al (EP 1 016 777 A2).

Regarding claim 9, Jobson et al discloses a radiation heater comprising: a self-heat exchange type heat exchanger having a partition type heat transfer material for parting a high temperature fluid and a low temperature fluid from each other, wherein the heat transfer material is bellows-shaped and is arranged such that both the fluids flow counter to each other mainly through a gap portion in the bellows section of the heat transfer material along the ridge line or valley line thereof, and the heat transfer material has a fluid forwarding space portion at one or both ends thereof crossing the ridge line of the bellows section for forwarding one of the fluids to the gap portion in the bellows section on the opposite side thereof, and the fluid which has been forwarded to the opposite side via the fluid forwarding space portion acts as the other fluid to be heat-exchanged to perform heat exchange; and (b) a burner disposed in the fluid forwarding space portion of the heat exchanger (see Abstract; paragraphs 0004, 0011, 0017, and 0028; and figure 2) such that a gas or oil burner may be used instead of the heating coils.

Jobson et al does not disclose a radiation heater wherein the wall parting the fluid forwarding space portion in which the burner is disposed from the exterior is formed by a heat radiating plate.

It would have been obvious tone having ordinary skill in the art at the time the invention was made to have two heating elements, since it has been held that mere

duplication of the essential working parts of a device involves only routine skill in the art (see MPEP 2144.04 (VI-B)).

However, Jobson et al discloses that other devices can be used such as gas or oil burner (see paragraph 0028) such that it would have been obvious to use a radiating plate as heating element (13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to a radiation heater wherein the wall parting the fluid forwarding space portion in which the burner is disposed from the exterior is formed by a heat radiating plate, since applicant has not disclosed that having a radiation heater wherein the wall parting the fluid forwarding space portion in which the burner is disposed from the exterior is formed by a heat radiating plate solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a radiation heater wherein the wall parting the fluid forwarding space portion in which the burner is disposed from the exterior is formed by a heat radiating plate.

Regarding claim 10, Jobson et al discloses a radiation heater comprising: a self-heat exchange type heat exchanger having a partition type heat transfer material for parting a high temperature fluid and a low temperature fluid from each other, wherein the heat transfer material is bellows-shaped and is arranged such that both the fluids flow counter to each other mainly through the gap portion in the bellows section of the heat transfer material along the ridge line or valley line thereof, and the heat transfer material has a fluid forwarding space portion at one or both ends thereof crossing the ridge line of the bellows section for forwarding one of the fluids to the gap portion in the

bellows section on the opposite side thereof, and the fluid which has been forwarded to the opposite side via the fluid forwarding space portion acts as the other fluid to be heat-exchanged to perform heat exchange; and (b) an exothermic reaction-accelerating catalyst supported on the entire surface of the heat transfer material of the heat exchanger or the surface thereof in the vicinity of the fluid forwarding space portion (see Abstract, paragraphs 0004, 0011, and 0015-0017; and figure 2).

However, Jobson et al discloses that other devices can be used such as gas or oil burner (see paragraph 0028) such that it would have been obvious to use a burner as heating element (13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a radiating plate as the heating element, since applicant has not disclosed that a heat radiating plate solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a heat radiating plate.

Regarding claims 22-23, Jobson et al discloses the radiation heater further comprising: a functional material selected from the group of an adsorbent and a heat storage material provided in the gap portion of the bellows section of the heat transfer material separately of the heat transfer material (see paragraph 0009).

Response to Arguments

Applicant's arguments with respect to claims 1-8, 12, 14-21, and 24 have been considered but are moot in view of the new ground(s) of rejection.

The amendments to claims 1-3 regarding the cross sectional area of the gas portion changes along the flow path of the fluids (see claim 1, line 9) and a functional material or an adsorbent and a heat storage material is provided in the gap portion of the bellows section of the heat transfer material as the air-permeable structure, different from the heat transfer material, or supported on the air-permeable structure, different from the heat transfer material (see claim 2, lines 14-17 and claim 3, lines 16-19) overcame the prior art references and required a new search.

Applicant's arguments filed August 8, 2008 have been fully considered but they are not persuasive.

Regarding 9-10 and 22-23, the examiner does not find applicant's arguments persuasive.

Although Jobson et al does not disclose a radiation heater, Jobson et al disclose the option to use any heating device for the heating element (13) such that use of radiating plates would have been obvious since radiating plates are known heating elements.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATASHA YOUNG whose telephone number is 571-270-3163. The examiner can normally be reached on Mon-Thurs 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. Y./
Examiner, Art Unit 1797

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797